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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/883,966	06/20/2001	Koichi Numata	109237	4446
25944	7590	03/23/2007		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER HANDAL, KAITI V	
			ART UNIT	PAPER NUMBER
			1764	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/23/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/883,966

Applicant(s)

NUMATA ET AL.

Examiner

Kaity Handal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 16, 19-26 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/8/2006 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-13, 16, 19-26 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-13, 16, 19-26 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: honeycomb filter.

Claims 1-13, 16, 19-26 and 31 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of

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elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the honeycomb filter (32) and the filtering member/partition (34).

Drawings

The drawings are objected to because in Figure 1, reference number (32 – honeycomb filter) points to one honeycomb filter cell or passage, whereas in Figure 2, reference number (32) is pointing to the filtering member/partition. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "32" and "34" in Figure 2 have both been used to designate/point to "partition". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-10, 12-13, 16, 20-23 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (US 4,036,180) in view of Gadkaree et al. (US 5,750,026).

With respect to claims 1, and 21-22, Noguchi teaches a fuel reforming apparatus (fig. 1) comprising: a reforming catalyst (222) that reforms raw gas including

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hydrocarbon fuel into reformed gas including hydrogen (col. 6, lines 51-61); and a honeycomb member (222) (col. 6, lines 4-5) comprised of an interstitial material/ceramic that carries the reforming catalyst on at least one face of the honeycomb member (col. 5, lines 67 – col. 6, lines 1-5).

Noguchi teaches the need to filter out soot (col. 8, lines 4-7), however, Noguchi fails to show details of the honeycomb member such as being a filter and having a plurality of gaps having an effective diameter of 10-100 microns. Gadkaree teaches a honeycomb filtering member (col. 7, lines 54-57) (figures 1-2) carrying a catalyst (col. 8, lines 1-2) including a plurality of gaps having an effective diameter of 0.05-50 microns (col. 15, lines 31-36) in order to have the honeycomb structure comprise a particulate filtration medium (col. 7, lines 56-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the honeycomb in Noguchi's apparatus with a honeycomb filtering member including a plurality of gaps having an effective diameter of 10-100 microns, as taught by Gadkaree, in order to have the honeycomb structure comprise a particulate filtration medium.

With respect to claims 2-3, Noguchi as modified by Gadkeere teaches wherein a raw material supply flow passage (fig. 2, 214) that causes the raw gas to flow along a first face (as illustrated) of the filtering member (honeycomb supporting catalyst (222) (col. 5, lines 67 – col. 6, lines 1-5)) and that supplies the raw gas to the filtering member and substantially parallel thereto (illustrated); and a processed gas flow

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passage (224) that causes reformed and filtered gas to flow along a second face of the filtering member and substantially parallel thereto (as illustrated).

With respect to claim 4, Noguchi further teaches wherein the raw material supply flow passage (214), the filtering member (honeycomb supporting catalyst (222) (col. 5, lines 67 – col. 6, lines 1-5)) and the processed gas flow passage (224) are constructed using a monolithic carrier made from the interstitial material/ceramic.

With respect to claims 5, 8, 12-13 and 23, Noguchi further teaches wherein the reforming catalyst (222) is carried by the filtering member (honeycomb supporting catalyst (222) (col. 5, lines 67 – col. 6, lines 1-5)) on the second face on the side of the processed gas flow passage (and also on the first face on the side of the raw material supply flow passage) (on the entire surfaces of the gaps) (col. 5, lines 67 – col. 6, lines 1-5).

Regarding limitations recited in claims 6, 9-10 which are directed to a manner of operating disclosed device, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115.

Further, process limitations do not have patentable weight in an apparatus claim.

See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

With respect to claims 7, 16 and 20, Noguchi teaches wherein the interstitial material forming the filtering member/honeycomb membrane is formed of a porous material/ceramic (col. 5, lines 67 – col. 6, lines 1-5).

With respect to claim 31, Noguchi teaches a fuel reforming apparatus (fig. 1) comprising: a reforming catalyst (222) that reforms raw gas including hydrocarbon fuel into reformed gas including hydrogen (col. 6, lines 51-61); and a honeycomb member (222) (col. 6, lines 4-5) comprised of an interstitial material/ceramic that carries the reforming catalyst on at least one face of the honeycomb member (col. 5, lines 67 – col. 6, lines 1-5).

Noguchi teaches the need to filter out soot (col. 8, lines 4-7), however, Noguchi fails to show details of the honeycomb member such as being a filter and having a plurality of gaps having an effective diameter of 10-100 microns. Gadkaree teaches a honeycomb filtering member (col. 7, lines 54-57) (figures 1-2) carrying a catalyst (col. 8, lines 1-2) including a plurality of gaps having an effective diameter of 0.05-50 microns (col. 15, lines 31-36) in order to have the honeycomb structure comprise a particulate filtration medium (col. 7, lines 56-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the honeycomb in Noguchi's apparatus with a honeycomb filtering member including a plurality of gaps having an effective diameter of 10-100 microns, as taught by Gadkaree, in order to have the honeycomb structure comprise a particulate filtration medium.

Noguchi as modified by Gadkeere teaches wherein a raw material supply flow passage (fig. 2, 214) that causes the raw gas to flow along a first face (as illustrated) of the filtering member (honeycomb supporting catalyst (222) (col. 5, lines 67 – col. 6, lines 1-5)) and that supplies the raw gas to the filtering member and substantially parallel thereto (illustrated); and a processed gas flow passage (224) that causes reformed and filtered gas to flow along a second face of the filtering member and substantially parallel thereto (as illustrated).

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (US 4,036,180) in view of Gadkaree et al. (US 5,750,026), as applied to claim 8 above, and further in view of Abe et al. (US 6,576,203 B2)

With respect to claim 11, Noguchi discloses all claim limitations as set forth above including the desire to generate hydrogen, Noguchi also teaches passing an air-fuel mixture through a burner to cause a partial oxidation of the mixture, however, his partial oxidation does not produce hydrogen (col. 4, lines 21-26). Noguchi fails to show wherein a partial oxidation catalyst that partially oxidizes the hydrocarbon fuel, wherein the partial oxidation catalyst is carried by the filtering member on the first face on the side of the raw material supply flow passage. Abe teaches a reformer having a partial oxidation catalyst that partially oxidizes the hydrocarbon fuel (page 5, paragraph [0094], lines 1-6), wherein the partial oxidation catalyst is carried by the filtering member of a honeycomb structure on the first face on the side of the raw

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material supply flow passage (page 6, paragraph [0105], lines 1-8) in order to generate hydrogen (page 5, paragraph [0094], lines 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a partial oxidation catalyst that partially oxidizes the hydrocarbon fuel, wherein the partial oxidation catalyst is carried by the filtering member in modified Noguchi, as taught by Abe, in order to generate hydrogen.

7. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (US 4,036,180) in view of Gadkaree et al. (US 5,750,026), as applied to claims 21-22 above, and further in view of Hwang et al. (US 4,522,894) and Doty et al. (US 5,098,455).

With respect to claims 24-25, Noguchi as modified discloses all claim limitations as set forth above including a nickel catalyst (col. 6, lines 6-13) but fails to show wherein reformer comprises soot removing means for removing soot that has been trapped by the soot trapping means. Hwang teaches power production wherein soot causes a rapid increase in reactor pressure drop when a nickel catalyst is employed (col. 17, lines 16-20). Doty teaches gas filter regeneration comprising soot removing means/glow plug (fig. 1, 20) in order to burn off collected soot and regenerate filtering element (col. 5, lines 51-55) and therefore regenerate said nickel based catalyst.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide soot removing means to Noguchi's modified

apparatus, as taught by Doty, in order to burn off collected soot on and regenerate filtering element and therefore regenerate said nickel based catalyst.

With respect to claim 26, Noguchi as modified teaches wherein the soot removing means/glow plug (fig. 1, 20) contacts soot that has been trapped by the soot trapping means with oxygen-containing gas/by means of burning (col. 5, lines 51-57).

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (US 4,036,180) in view of Gadkaree et al. (US 5,750,026), as applied to claim 1 above, and further in view of Jahnke et al. (US 6,149,859).

With respect to claim 19, Noguchi as modified discloses all claim limitations as set forth above including a raw material preparing portion/combustion chamber (174) that gasifies hydrocarbon fuel and that mixes fuel with air but fails to show wherein said raw material preparing portion, in addition to gasifying hydrocarbon, mixes air with water vapors to prepare raw gas. Jahnke teaches a gasifier (fig. 1, 10) that gasifies hydrocarbon fuel (5) and that mixes air (6) (col. 5, lines 1-8) with water vapors (col. 5, lines 21-25) in order to prepare synthesis gas (col. 5, lines 1-8).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a gasifier in Noguchi's modified apparatus, as taught by Jahnke, in order to prepare the synthesis gas.

Response to Arguments

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Applicant's arguments with respect to claims 1-13, 16, 19-26 and 31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KH

3/15/2007


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